Non Vital Pulp Therapy
Outline

- Indications and procedure for non vital pulpotomy
- Indications and procedure for pulpectomy
- Indications and procedure for apexification
- Root canal sealants for pulpectomy in primary teeth.
- Conclusion
• Ideally, pulpotomy is limited to vital teeth.
• Non vital teeth should be treated by pulpectomy where the tooth is restorable.
• When the tooth is non-restorable, then consider extraction.
• But in some cases, it is not possible to do a pulpectomy because of non-negotiable root canals like in primary molars. In these case, non vital pulpotomy can be done.
Indications for Non Vital Pulpotomy

- In non-vital primary molar
  - History of spontaneous pain
  - Swelling of the oral mucosa
  - Tooth mobility
  - Radiographic evidence of interradicular swelling
- In patients with limited cooperation
Non Vital Pulpotomy

Two Appointment Procedure:
• In the first appointment, necrotic pulp from the pulp chamber is removed and the radicular pulp is treated with Beechwood creosote and the cavity is sealed with temporary restorative material.
• In the second appointment, if the tooth is asymptomatic, an antiseptic paste is placed in the pulp chamber, restor the tooth and place a stainless steel crown.
Anaesthesia is compulsory to prevent pain from oral mucosa. You do not expect pain from the tooth since the pulp tissue is dead.

- Use rubber dam to maintain dry sterile field, prevention of aspiration or swallowing of dental instruments, isolate tooth and prevent soft tissue injury.

- Infection control principles must always be applied.

- Consider the restorability of affected tooth.
Procedure for Non Vital Pulpotomy

First Appointment:
• Use No 330 bur to create your cavity outline.
• Remove all carious dentine and the roof of the pulp chamber with a slow speed round bur.
• Remove necrosed coronal pulp with a spoon excavator.
• Irrigate coronal pulp chamber with normal saline
Procedure for Non Vital Pulpotomy

First Appointment:
• Place a cotton pellet moistened with beechwood creosote on the orifice of the canals
• Seal the canal with temporary cement for 10 – 14 days.
Second appointment:

- Remove the temporary seal and cotton pellet with beechwood creosote.
- Check to ensure no symptoms persist. Where symptoms persists like presence of sinus, discharge, then repeat the procedure.
- If no symptom, place antiseptic dressing in pulp chamber, restore tooth, place stainless steel crown.
Objective for placement of Beechwood Creosote:

- Beechwood creosote is as a disinfectant
- Its fume ‘sterilises’ the dentinal tubes and accessory canals
- It also ‘sterilises’ the necrotic pulp tissue in the radicular pulp canal.
Objective for antiseptic dressing:
• The antiseptic dressing is a mix of one drop of formocresol, one drop of eugenol mixed in ZnoE.
• The dressing enables the formocresol fume to ‘mummify’ the necrotic pulp tissues.
• The mummified tissue is not expected to undergo liquefactive degeneration since it is ‘sterile’ and fixed.
• The necrotic pulp tissue can stay in situ till the tooth exfoliates.
Follow-up Assessment

Clinical Evidence of failure:

- Pathological mobility
- Presence of fistula
- Pain on percussion
Follow-up Assessment - 2

Radiographic Evidence of failure:
• Increased size of periapical/interradicular lucency
• Internal root resorption
• External root resorption
Pulpectomy

It is a procedure that is performed in primary and permanent teeth when both the coronal and the radicular pulp tissue show clinical evidence of irreversible infection.
It involves the excavation of the necrotic pulp tissue in the coronal pulp chamber and the extirpation of the necrotic pulp tissue in the radicular pulp chamber.

The objectives are to remove disease tissue and maintain tooth in the dental arch.
Indications for Pulpectomy

Clinical Indications

• History of spontaneous pain
• Presence of intraoral swelling indicative of dentoalveolar abcess or sinus
• Excessive hemorrhage at site of amputation
• Mild to moderate tooth mobility
• Clinically evidence of pulp exposure
Radiographic Indications

- Carious lesion or trauma involving the pulp with
- Periapical or interradicular radiolucency
- Pathologic root resorption not involving more than a third of the root in the primary tooth.
Contra-indications for Pulpectomy

- Excessive tooth mobility with loss of bone support
- Non-restorable tooth.
- Extensive root resorption: more than two thirds of the root.
- Perforation of the pulpal floor.
- Medically compromised children.
Procedure

- Anesthetize the area
- Isolate the tooth with a rubber dam
- Remove all carious lesion
- Prepare the access cavity
- Excavate tissue in pulp chamber and debride
- Extirpate radicular pulp using fine barbed broaches or files.
• Determine the working length 1 -1.5mm short of the radiographic apex starting with a small file (size 10) and progressing sequentially to a larger file (size 35).
• Clean and shape the canals using K or Hedstrom files.
• Irrigate using 5% sodium hypochlorite during cleaning and shaping of the root canals and dry with sterile paper points.
• Fill radicular with zinc oxide eugenol paste or a resorbable material using a syringe or in increments using a reamer for primary teeth. For permanent teeth seal in gutta percha.
• Take an intraoral pericipical radiograph to evaluate the quality of filling.
• Restore tooth to function.
Limitations with pulpectomy for primary molars

- Accessory canals are present so complete pulp extirpation not possible.
- Radicular pulp tissue is ribbon-like in shape so challenges with biomechanical preparation of the radicular pulp canal.
- Root is slender and flat mesio-distally increasing risk for root perforation during biomechanical preparation of radicular pulp canal.
Complications associated with pulpectomy

- Internal or external root resorption
- Delayed exfoliation of primary tooth
- Localised discolouration of succedaneous tooth in contact with root filling materials
Apexification

• A method of inducing calcific bridge formation in a young permanent tooth using a suitable medicament.
• The procedure is indicated in young permanent tooth with non-vital pulp.
Apexification - 2

Indication of incomplete root formation

• Blunderbuss appearance in a tooth where the root length is incomplete. The root canal walls flare, apex is funnel shaped and wider than the coronal aspect of the canal.

• Non-blunderbuss when the root length is complete but the apical foramen is not close.
Challenges with open apex

- No hard tissue stop against which gutta percha can be packed
- Blunderbuss root ending makes it difficult to obturate root with root filling materials.
Apexification - 4

Procedure

• Administer Local anaesthesia
• Isolate tooth with rubber dam
• Remove all carious lesion
• Prepare the access cavity
• Excavate tissue in pulp chamber and debride
• Extirpate radicular pulp using fine barbed broaches or files.
Apexification - 5

Procedure

• Determine the working length 1 -1.5mm short of the radiographic apex starting with a small file (size 10) and progressing sequentially to a larger file (size 35).

• Clean and shape the canals using K or Hedstrom files.

• Irrigate using 5% sodium hypochlorite during cleaning and shaping of the root canals and dry with sterile paper points.
Apexification - 6

Procedure

• Apply non setting calcium hydroxide into the canals incrementally keeping it 2–3mm short of the radiographic apex.

• Temporise the tooth with composite resin, or GIC or ZOE.

• Recall a week after followed by every 6 weeks recall and 3 months recall.
Apexification - 7

Other dressing materials

• Antiseptic and antibiotic paste (Frank)
• Tricalcium phosphate
• Collagen calcium phosphate gel
• Zno and metacresylacetate-camphorated parachlorophenol
MATERIALS FOR SEALANTS FOLLOWING ROOT CANAL THERAPY IN PRIMARY TEETH
Root filling materials

Criteria for ideal root filling material in primary tooth:

• Antiseptic
• Resorbable
• Harmless to adjacent tooth germ
• Radiopaque
• Easily inserted
• Easily removed
• Biocompatible
Kri 1 paste

Formula

• Chlorophenol 2.02%
• Camphor 4.86%
• Menthol 1.215%
• Iodoform 80.80%
Properties
• Highly resorbable
• Bactericidal
• Healthy tissue ingrowth at apex
• Success rate of kri I paste is 84% when compared with 65% rate of ZOE
Vitapex

Composition

• Iodoform and calcium hydroxide
• The calcium hydroxide component stimulates the periapical tissues in order to maintain health or promote healing. It also has antimicrobial effects.
Mechanism of action of CaoH

Action of calcium hydroxide

• Antibacterial in nature.
• The alkaline pH neutralizes lactic acid from osteoclasts and prevents dissolution of mineralized components of teeth.
• This pH also activates alkaline phosphatase that plays an important role in hard tissue formation.
Mechanism of action of CaoH

Action of calcium hydroxide

• It denatures proteins found in the root canal and makes them less toxic.
• It activates the calcium-dependent adenosine triphosphatase reaction associated with hard tissue formation.
Mechanism of action of CaOH

Action of calcium hydroxide

- It diffuses through dentinal tubules and may communicate with the periodontal ligament space to arrest external root resorption and accelerate healing.
Root filling materials

Endoflas
• Iodoform
• Ca(OH)2
• Zinc oxide
Root filling materials

Maisto’s paste
- Iodoform
- Parachlorophenol
- Camphor-methol

Ledermix
- Dimethylchlorotetracycline
- triamcinolone
Indications for non-vital pulpotomy:

- History of occasional pain
- Swelling of the oral mucosa
- Complete tooth resorption
- Radiographic evidence of interradicular swelling
Root filling materials for primary teeth:

- Kri paste
- Zinc oxide eugenol
- Ledermix
- Gutta percha
Apexification:

- Indicated in non-vital young teeth
- Objective is to create an apical stop
- Indicated in primary molars and incisors
- Affected teeth needs a crown
Conclusion

• Pulp therapy in children is very controversial but rewarding. A good history, clinical and radiographic examinations are very important in diagnosis and treatment. Knowledge of the materials used is also very important.
THANK YOU
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